

## Executive Summaries

### Economics of Obesity

#### *The Economic Burden of Obesity on Rural Communities: A Case Study of Kentucky Homeplace Counties*

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The increasing prevalence of obesity and the health-related costs of obesity are of concern to healthcare providers, professionals and communities at large. Two out of every three adults in America are considered overweight or obese, compared to less than one in every four persons four decades ago. The economic burden of overweight and obesity is rising in the United States. The costs associated with overweight and obesity account for \$117 billion, over 9 percent of total U.S. medical costs, with \$61 billion in direct costs, and \$56 billion in indirect costs.

This economic burden is greater among residents of the South and rural areas. Dietary quality and quantity, low levels of physical activity, the physical environment, and certain policies adopted by public and private institutions work in concert to create an environment where most people find it difficult to maintain a healthy body weight. Overweight and obesity have been linked to unhealthy diets and physical inactivity. Kentucky ranks 39th in meeting the healthy dietary consumption, and second highest in physical inactivity in the nation.

The objective of this study was to estimate the county-level economic burden of obesity in the rural South. Specifically, 59 counties in Kentucky were selected. County selection was based on the availability of data via a Medicaid-financed program known as Kentucky Homeplace. Homeplace data served as the basis for the economic burden of obesity estimates at the county level.

A second objective was to develop a methodology that could be applied to limited data sets to estimate the economic burden of obesity at the county or community level. To date, the literature on the economic burden of obesity has focused on estimating National and State-level expenditures. However, this same information may be useful to local decision makers as they too face resource allocation decisions related to preventing or reducing obesity at the community level. This research is the first known effort to estimate the economic burden of obesity at the county level.

In estimating the economic burden of obesity at the county level, it is important to focus on the out-of-pocket expenditure category. As medical costs are shifted to these patients, Medicare, Medicaid, and private insurance obesity-related expenditures are shifted to taxpayers and to insurance companies mostly located outside of rural communities. The burden of out-of-pocket expenditures thus falls on the households located in the study counties. The results indicate that the economic burden of obesity is significantly higher for obese individuals compared to normal weight individuals. This finding is of particular interest to Medicare and uninsured individuals.

These findings may not be generalizable to the population, as the sample has an over-representation of older, female population compared to the population at large. However, this limitation does not affect the general process used to estimate the county-level economic burden of obesity; it does point to the need to check sample statistics.

This study found the out-of-pocket economic burden of obesity for the 59 Kentucky counties was nearly \$38 million. This burden is distributed in differing degrees within counties based on their sociodemographic characteristics and levels of obesity, and is not solely a function of population size. This economic burden on individuals could present an opportunity for a county willing to invest in obesity prevention or reduction measures.

## ***The Economic Impact of Obesity in the South: Assessing Medical Spending Attributable to Obesity***

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The study objectives were to:

- (1) Determine the prevalence of overweight and obesity among adults in the Southern Region of the United States
- (2) Estimate the increase in adult per capita medical spending attributable to overweight and obesity
- (3) Assess overweight and obesity related healthcare expenses (both in dollars and as a percentage of total spending)
- (4) Analyze costs by payer group and sociodemographic groups.

Two nationally representative data sets were used to develop cost estimates: the Medical Panel Survey (MEPS) and the National Health Interview Surveys (NHIS). MEPS is conducted by the Agency for Healthcare Research and Quality (AHRQ). It is a nationally representative survey of civilian non-institutionalized population that collects data about people's healthcare utilization and annual medical spending, including the percentage of spending by out-of-pocket and third-party payers. MEPS contains information about insurance status, region (Northeast, Midwest, South, and West), and sociodemographic variables.

Assessing medical expenditures related to overweight and obesity in the Southern Region can inform policy for food and nutrition assistance programs and strategies to address weight loss and prevent weight gain. In addition, state health departments may use the information to develop new prevention programs appropriate for their populations.

The sampling frame was derived from linking the 1996-2000 MEPS public use file to the records of the same persons in the appropriate years of the NHIS. Height and weight data, necessary to calculate Body Mass Index (BMI), were available for a subset of adult NHIS participants and were merged with the MEPS data. The final sample included adults nineteen years of age and older residing in the Southern Region with weighting variables that allowed generation of regionally representative estimates. Excluded from the analysis were those in the MEPS/NHIS population missing height and weight data, which included all individuals under 18 at the time of the NHIS interview and pregnant women.

A four-equation regression approach was used to predict annual overweight- and obesity-attributable medical spending. Variables representing the four BMI categories (underweight, normal, overweight, and obese) were included in the regressions to predict their impact on annual medical spending. All regressions controlled for age, sex, race/ethnicity, income, education, and marital status. Insurance status (i.e., private, Medicaid, Medicare, uninsured) was included to estimate the increase in annual medical spending attributable to overweight and obesity for each insurance category. Prevalence rates were combined with per capita spending estimates, and the percentages of aggregated expenditures attributable to overweight and obesity were computed.

Based on the data analysis, overweight and obesity are pervasive in the Southern Region; prevalence rates are increasing; associated medical costs are significant; expenditures vary by age, gender, race, and payer group; rates are highest among those receiving public assistance; and the greatest increases in expenditures are among private and out-of-pocket payers.

This research provides the first estimates of obesity-related medical costs in the Southern Region. The results can be used to estimate cost savings associated with incremental reductions in the prevalence of obesity in the south. Trends in obesity-related medical spending over time could be determined by comparing future estimates of spending with baseline data from this study.

Findings may be used to develop obesity-related programs by public agencies, private health plans, and employers. Findings may guide policymakers who determine the distribution of limited resources to address obesity prevention or develop policies for food and nutrition assistance programs. Since some of these programs are a source of nutrition education for low-income families, they may play a role in the prevention of obesity.

***An Age-Period-Cohort Analysis of the Rise in the Prevalence of the U.S. Population Overweight and/or Obese (PO&O)***

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This research examines trends in the propensity of obesity and overweight (PO&O) in the United States from 1976 to 2001. An age-period-cohort analysis examined:

- (1) The life course trajectory of weight gain
- (2) The years in which Americans displayed the greatest degree of weight gain
- (3) Whether trends differ by birth cohort.

The objective was to isolate time periods and determine which time periods are associated with a detrimental impact on Americans' weight.

The analyses use data from the National Health Interview Survey (NHIS), a nationally representative annual health survey conducted by the National Center for Health Statistics. The NHIS data are adjusted for the misreporting of weight and height. The analyses use demographic methods, specifically age-period-cohort analysis, and ordered logit models.

The ordered logit models show that the probability of being obese versus overweight, and overweight versus normal weight has increased in every 5-year period, after controlling for a host of factors. Between 1976 and 2001, the probability of the adult population being obese has tripled. The probabilities of obesity for women are now nearing those of men. Of the race/sex groups studied, Black and Hispanic females possess the highest probabilities of being obese, with Black women having a higher probability. Hispanic men have the highest probability of being obese. When the data are disaggregated by year, the results show the youngest age groups are increasing their likelihood of being obese at the fastest rates.

Findings indicate that for every age group and for every birth cohort, current group average Body Mass Indexes (BMIs) are larger than the previous period's BMI. Altogether, the adult population in the United States has increased its BMI every 5-year period between 1976 and 2001. Further, the growth in PO&O seems to be accelerating over time. Taking into account the characteristics of the population does not mitigate the effect of period on Americans' increased weight gain. One limitation of the data is that the sample contained

adults only. It is not known how many individuals entered the sample already overweight or obese.

Because every birth cohort and age group showed an increase in BMI, explanations that focus on specific subpopulations were not supported by the data.

Initially, it was hypothesized that a particular time period, age group, or cohort could be isolated as an indicator of BMI increase. If that had been the case, one could target policy interventions and design appropriate policy interventions to mitigate the situation. The findings demonstrate that this was not the case and that period effects dominate: the PO&O increases with every time period, without exception.

This study provides some important insights into the age-period-cohort effects of PO&O. Future research might concentrate on the aspects of American culture that result in eating behavior that yields PO&O, how the American lifestyle might be adapted to expend more energy, and how public policies might arrest the PO&O trend in the United States.